# HLC-100 Compact Servo Hydraulic Universal Testing Machine

**Application:**

This series hydraulic universal testing machine is compact design with powerful functions. It is computer-controlled precision testing machine, suitable for wide range of material for tension, compression, bending and shearing test etc. It has high stability as well as high precision, equipped with PC system & printer for graph, test result display, printing & data processing. Complete with modulus for metal, spring, textile, rubber, plastic and other material testing. It is widely used in many fields such as industry factories, mineral enterprise and high schools.

**Applied Standard:**

Load meets or exceeds the following standards: ASTM E4, ISO7500-1, EN 10002-2, BS1610, DIN 51221. Strain measurement meets or exceeds the following standards: ASTM E83, ISO 9513, EN 3846, EN 1002-4.

**Main Specifications:**

- Max. Load: 100kN
- Load accuracy: ±0.5%
- Strain accuracy: ±0.5%
- Tensile space: 350mm
- Piston stroke: 200mm
- Load speed: 0.5-100mm/min
- Return speed: 100mm/min
- Compression space: 600mm
- Distance between columns: 360mm
- Tensile specimen: Round: Ø4-20mm; Flat: 0-21mm
- Compression platen: Ø120mm
- Dimensions: 500x510x1605mm
- Net weight: 180kg

**Safeguard:**

- Overload protection: when the testing load is over 2%-5% of max. load, the system will unload.
- Stroke protection: when the ram arrives at the upper limited position, the motor of oil pump will stop.

**Standard Accessories:**

- Tensile grips

Tensile grips for round specimen: Φ4~Φ9mm; Φ9~Φ14mm; Φ14~Φ20mm;

Tensile grips for flat specimen: 0-7mm; 7-14mm; 7-21mm

Grip for flat specimen          Grip for round specimen

- Compression plates: Dia: 120mm          1 set



- Clip-on Extensometer:                                    1 set

  Gauge length: 50mm; Travel: 10mm.



- Photoelectric encoder:                                    1 pc



- High precision Load cell:                                1pc



- Computer & software & printer                    1 set

  Computer: Dell or Lenovo;

  Software: English & **Russian** Version (For details, please refer **Annex-1**);
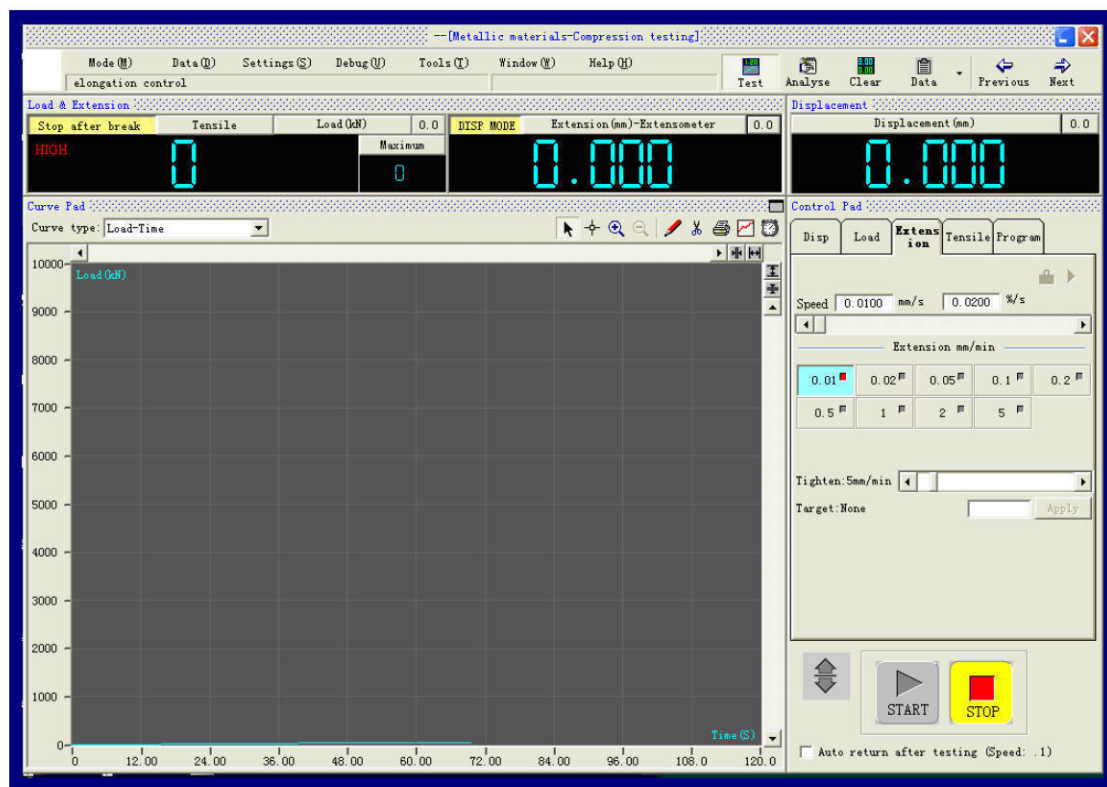
  Printer: HP Color ink

**Environment of testing machine**

- Operating temperature: +10℃ to +38℃

- Storage temperature: -40℃ to +66℃

- Humidity range: +10% to +90%, non-condensing

- Atmosphere: Designed for use under normal laboratory conditions. Protective measures may be required if excessive dust, corrosive fumes, electromagnetic field or hazardous conditions are encountered.

**Annex-1 Introduction of the software:**

**Features of Measuring & Control software**

TE software refers to the software characteristics of the top manufacturers of testing machine in the world and proposals of various testing requirements from the end users, and combines all the advantages of former versions of software with lots of new features. Optimized software structure makes the testing operation easy, convenient and powerful. Main interface as following,

**Features:**

1. Full digital control

The whole measuring and control system adopts the special controller, which can achieve the digital adjustment of zero point and gain of load, deformation and displacement, and it's easy to operate and possesses the high reliability.

2. Possess the functions of storage, setting and loading for various kinds of parameters, which make it convenient to connect multiple transducers with one load frame.

3. Realize the close-loop control, and show the reference curve during the executive operator adjusting the close-loop parameters, so the user can observe the close-loop effect caused by the parameters.

4. Perfect intelligent expert system of control mode to offer the automatic programming function. The user can set control mode during the test or each step of the test as the regulation according to the user's actual needs to compile the program, which can meet the test requests of various kinds of materials and test standards at home and abroad.

5. Perfect graphic function to complete the functions of the reappearance, amplification, reduction, self-adaptation, lapping of the curves, display and print the curve at the appointed range, observe the coordinate of the test point.

6. Data processing supports automatic analysis and graphic man-machine mutual processing, which is

convenient to check and compare the test results.

7. The user can self-define the output of the test reports, which has the utmost flexibility.

8. Perform the automatic inspection of the operation system,;   real-time acquisition and control under the platform of Win2000、WinXP, etc. NT mode; accurate timing and high-speed sampling;

9. Multilevel identity management integrates the flexible function of the testing machine with easy operation, which not only makes the operation easy by ordinary operator but also protect the system effectively.
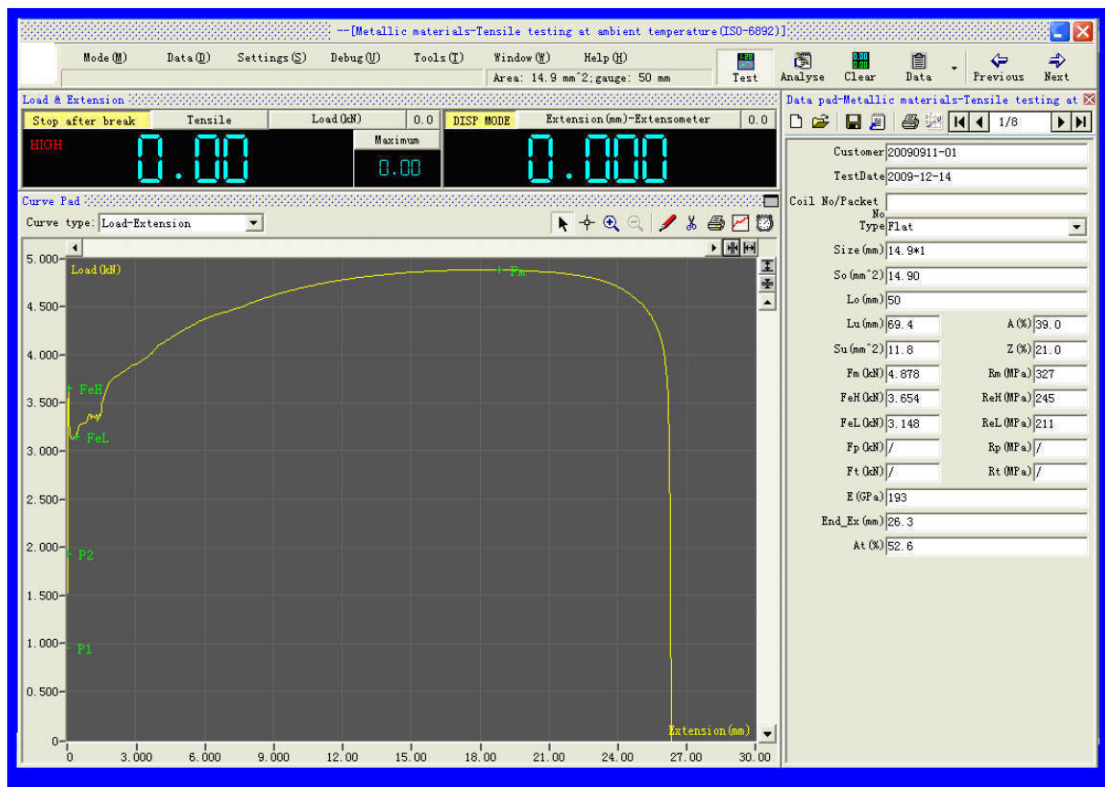
10. Framework type design concept and open type program structure make it easy to extend the function of the machine and further exploitation for the user. It can also connect externally internet program module to complete the requests of data connecting internet.

11. Based on the database, test data is stored by form of text file, which is convenient for the user to inquire about and utilize the various kinds of commercial report forms to reprocess the test data, meanwhile transfer the data to the internet conveniently.
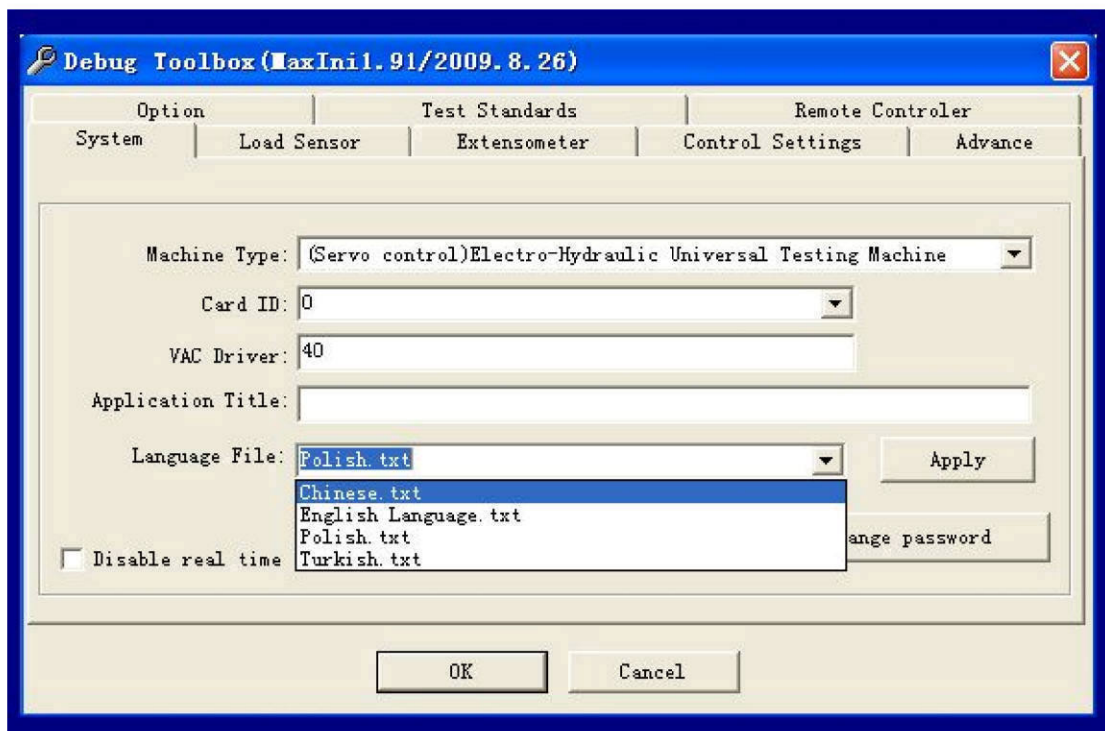
12. Multilevel identity management
Multilevel identity management, different identity has different functions, which not only makes the operation quick by ordinary operator, but also protect the system effectively.

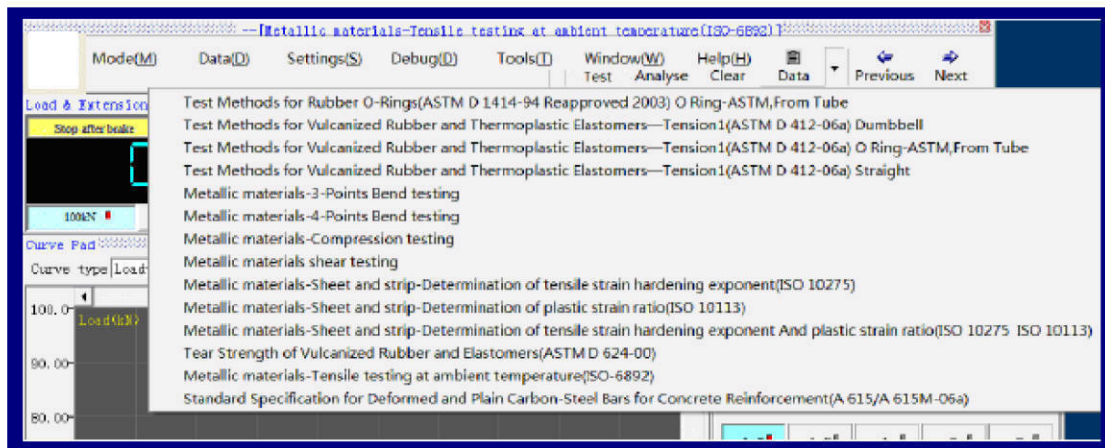**Please see more information with some pictures:**

The control modes, test data and curves can be displayed in real time in the main interface and can be shifted at any time.
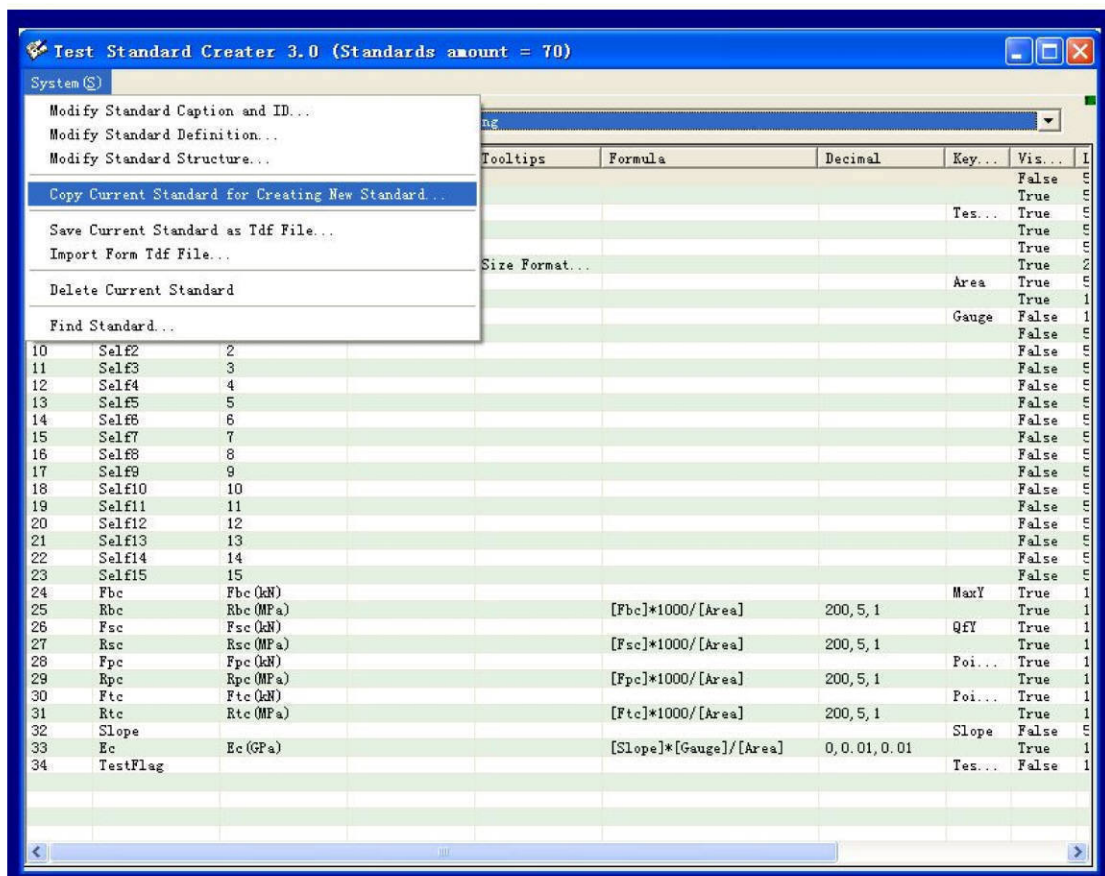


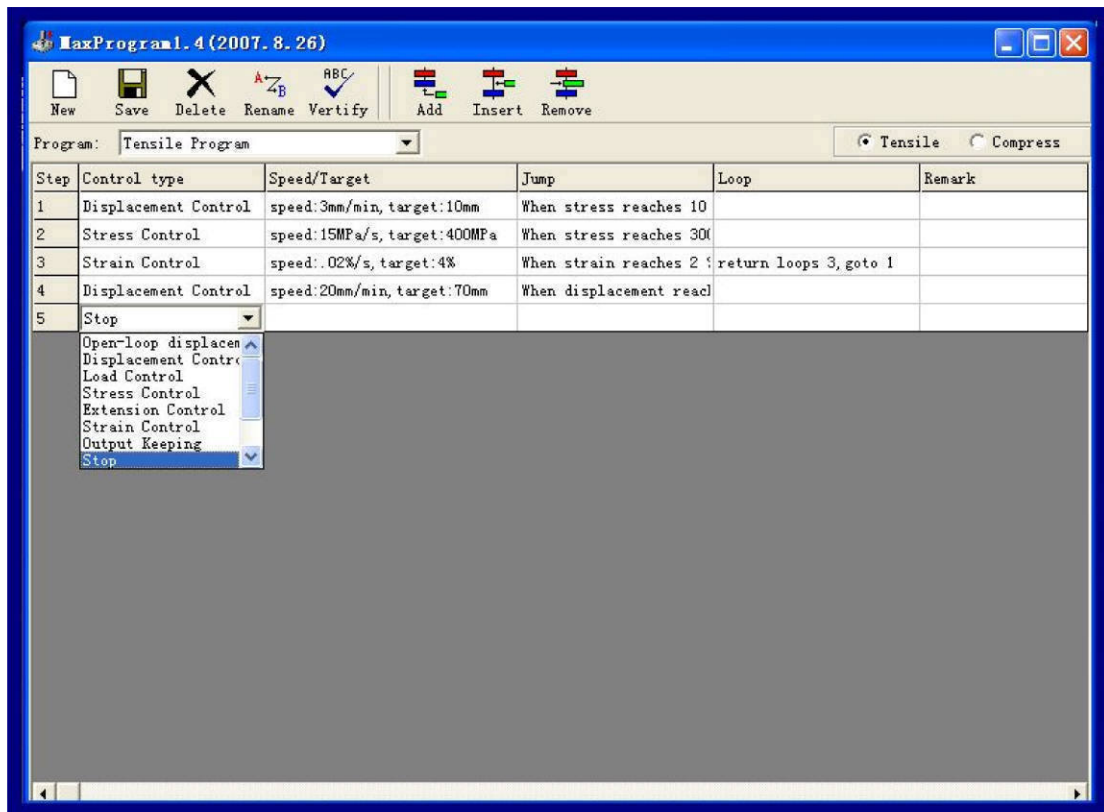The deep-seated parameters of software are contained in Debug Toolbox

Multi-language function:

With the flexible language edited function, it can support multi-language such as English, Chinese etc. and you can translate the software language into the native language by yourself.
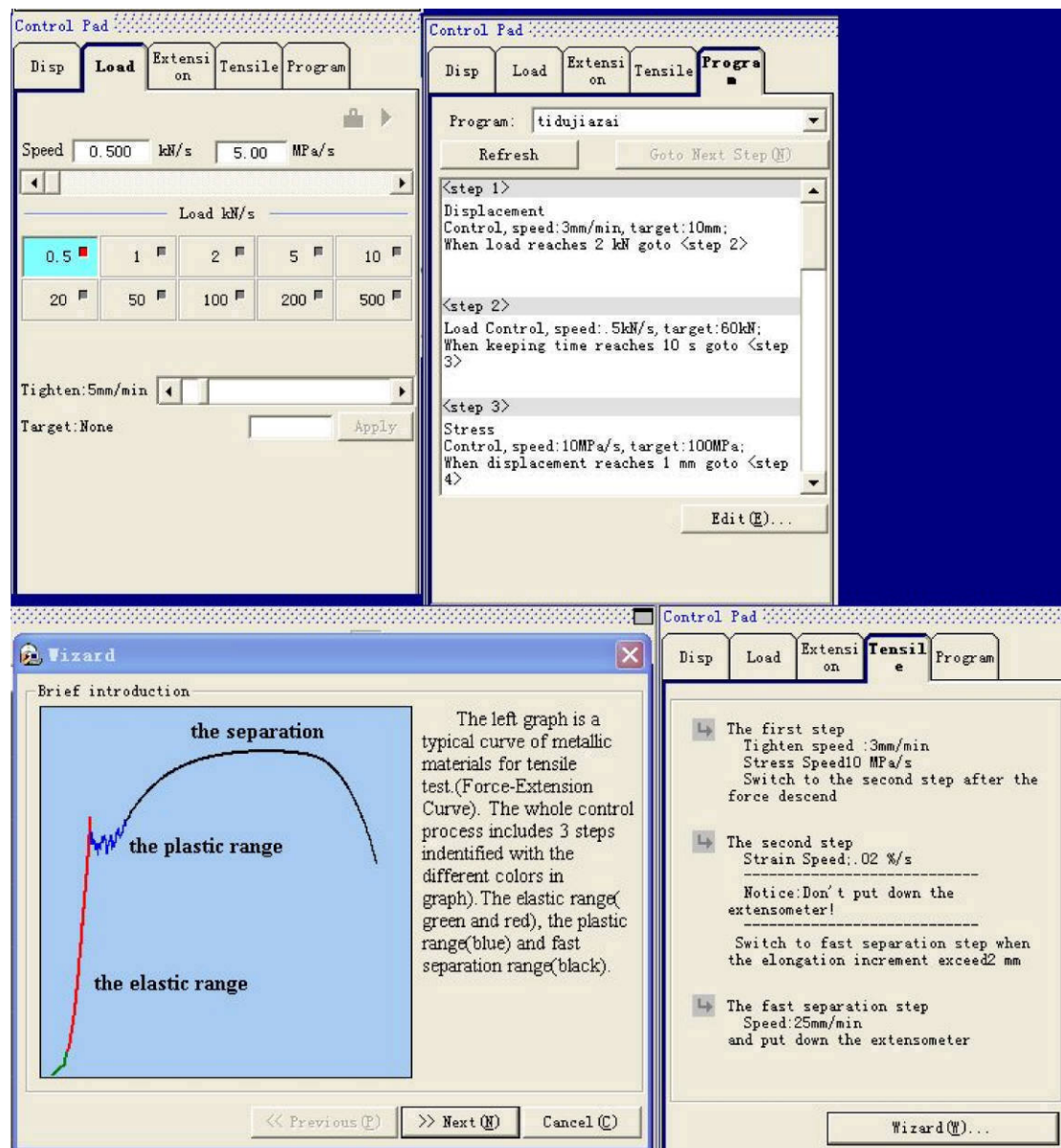


Software supports all kinds of popular testing standards i.e. ISO, ASTM, BS EN, DIN, JIS, GB etc. Users can modify and add own testing standards and methods.

**MaxProgram1.4 (2007.8.26)**

Program: Tensile Program | ○ Tensile ○ Compress

| Step | Control type | Speed/Target | Jump | Loop | Remark |
|---|---|---|---|---|---|
| 1 | Displacement Control | speed:3mm/min,target:10mm | When stress reaches 10 | | |
| 2 | Stress Control | speed:15MPa/s,target:400MPa | When stress reaches 300 | | |
| 3 | Strain Control | speed:.02%/s,target:4% | When strain reaches 2 | return loops 3,goto 1 | |
| 4 | Displacement Control | speed:20mm/min,target:70mm | When displacement reach | | |
| 5 | Stop | | | | |

Open-loop displacen
Displacement Contro
Load Control
Stress Control
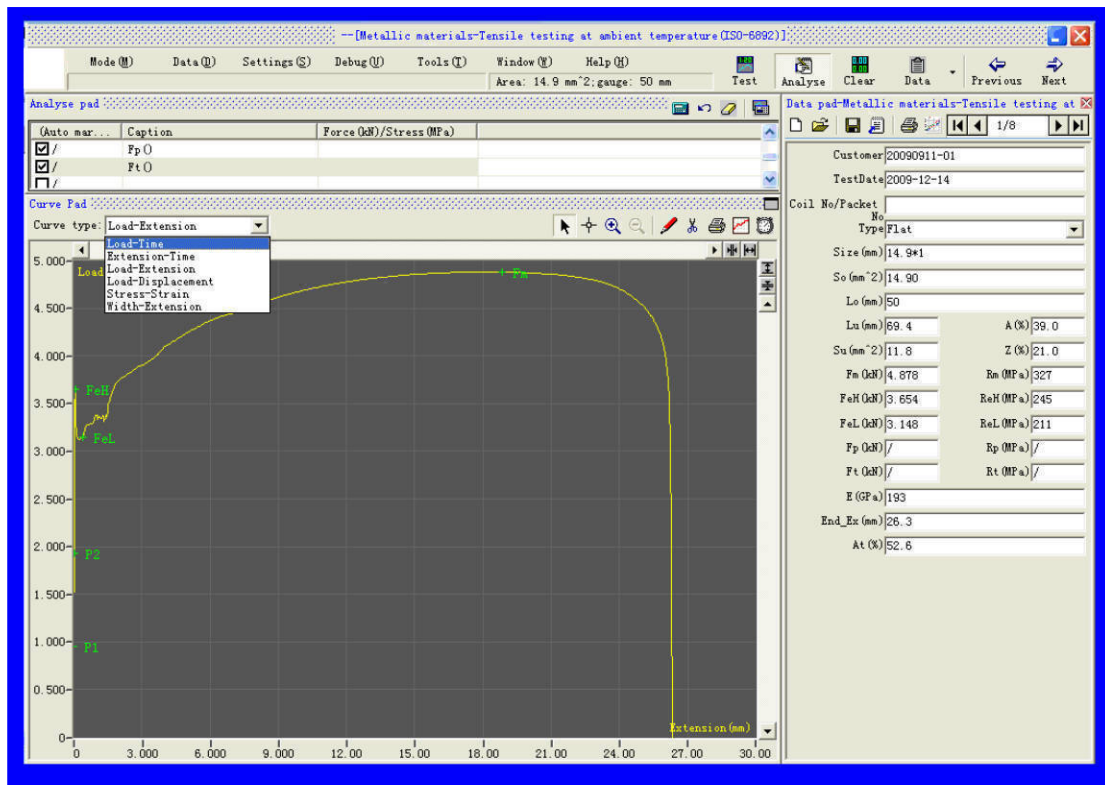Extension Control
Strain Control
Output Keeping
Stop

MaxProgram Editor possesses of multiple full digital control modes, i.e Displacement control, Stress (Load) control, Strain (Deformation) control, Low cycle control. User can edit the most complex and logical procedure by MaxProgram Editor. The combination of above functions can meet all kinds of routine test purpose.
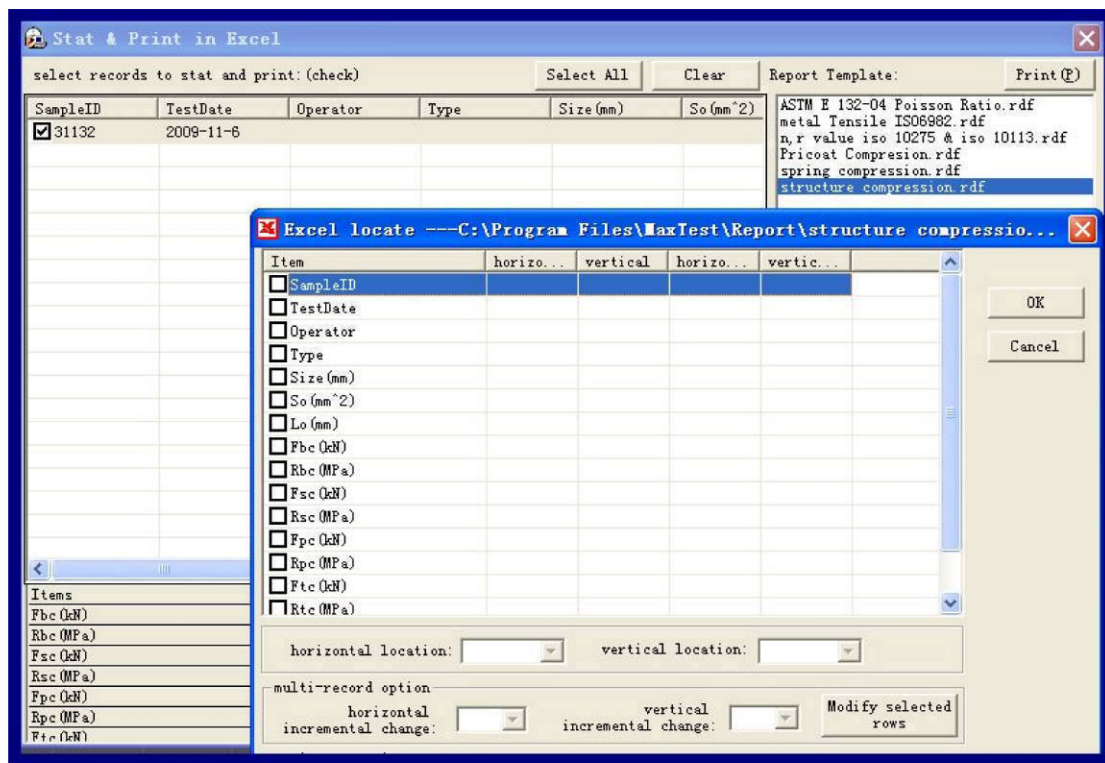
Through the Tensile Program Editor, user can setup test steps according to the requirements of standards.

Multiple curves function in real time display including Load-Extension, Load-Displacement, Stress-Strain, Load-Time, Extension-Time, and Width-Extension.

Characteristic points such as Elastic Modulus, Yield points, Rp, Rm etc. can be marked on the curves, for a highlighted and visual observation.

Test result can be obtained automatically and also it can be got from the test curves manually.
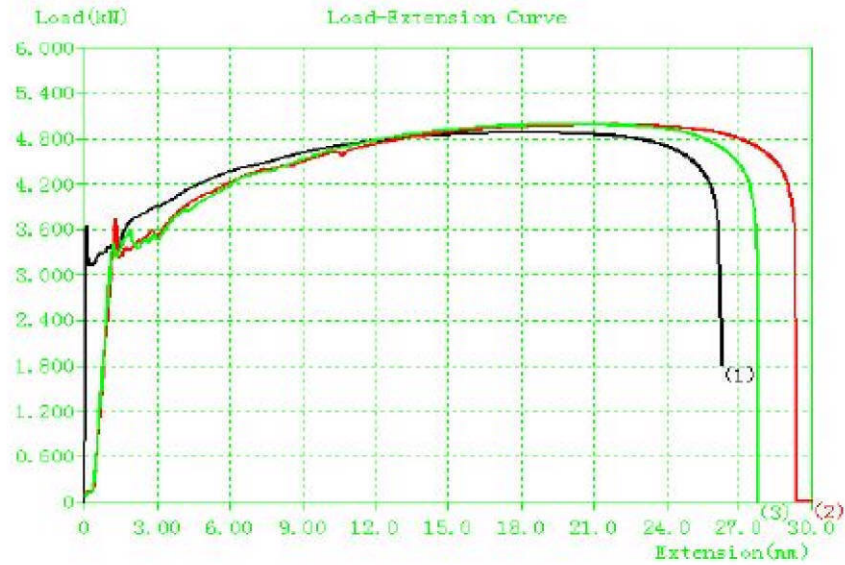
TE software contains all kinds of Report Templates. Customer can design various testing reports according to the requirements. Test result and curve can be printed in Excel or the auto-creating report template.

# Metallic materials -- Tensile testing at ambient temperature
## ISO 6892 : 1998

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| TestDate | 2009-9-11 | | | Operator | LW | | | |
| Temperature | 20℃ | | | Size(mm) | 14.9*1 | | | |
| Lo(mm) | 50 | | | So(mm^2) | 14.9 | | | |

| PrintID | SampleID | Rm(MPa) | ReH(Mpa) | ReL(MPa) | Rp(MPa) | E(GPa) | A(%) | Z(%) |
|---|---|---|---|---|---|---|---|---|
| 1 | QD01 | 327 | 245 | 210 | 233 | 193 | 39 | 21 |
| 2 | QD02 | 334 | 251 | 223 | 234 | 198 | 42 | 23 |
| 3 | QD03 | 335 | 240 | 229 | 228 | 205 | 38 | 27 |
| 4 | | | | | | | | |
| Max value | | 335 | 251 | 229 | 234 | 205 | 42 | 27 |
| Min value | | 327 | 240 | 210 | 228 | 193 | 38 | 21 |
| Average value | | 332 | 245.3333 | 220.6667 | 231.6667 | 198.6667 | 39.6667 | 23.667 |



Print Date: 2009-12-8

Except the clip-on Extensometer, TE software supports Long Travel Extensometer, Full Automatic Extensometer, video Extensometer, laser Extensometer, and it can be added eight Extensometers at most.



TE software supports four load cells.